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# ROTUNDA

Summer 1971

Volume 4, Number 3



CÉRAMIQUES  
DE FRANCE

WHEN THE EARTH SPEAKS





# ROTUNDA

the bulletin of The Royal Ontario Museum

Volume 4, Number 3, Summer 1971

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*The cover: Circular dish in Persian style, from the Céramiques de France exhibition at the ROM*



## Spotlight with the Editor

*Past, present and future  
at the ROM*

*Dr. Hsio-Yen Shih, Curator of the Far Eastern Department, and Rabbi Gunter Plaut of Holy Blossom Temple discuss an ornamental stone bowl from K'ai-feng.*

### THE JEWS IN CHINA

ROM has made an extended loan, appropriately enough to the Holy Blossom Temple in Toronto, of objects from a synagogue established in China in 1163.

For several centuries western scholars had been intrigued by reports of a small colony of Chinese Jews living in K'ai-feng, in Honan Province, northern China. The Jesuits who went to China in the 17th and 18th centuries made contact with some of them and several 19th century churchmen visited the city and its Jewish families.

It remained for a Canadian, Bishop William C. White, who later became Curator of ROM's Far Eastern Department, to make a study of these people, their history and their genealogies.

While studying and photographing the 20th century descendants of this ancient colony, Bishop White arranged for the memorial stone recording the early history of the community to be preserved, and collected relics of the vanished synagogue of K'ai-feng. He brought the objects he was able to assemble to Toronto, where they have been in the Chinese collections of the Far Eastern Department for many years.





However, due to lack of gallery space, the objects have been scattered in various study areas of the museum. Now in a reception area of Holy Blossom Temple they are available for viewing by the public.

The objects are varied, and rich in historical associations. Although the Rolls of the Pentateuch had been taken to England in the 19th century, the lacquered wooden Torah case was obtained for the Museum, and the Bishop was able to find some manuscript leaves from the Book of Genesis. Perhaps the most handsome piece is a black sounding stone originally used to call worshippers together, and carefully preserved by the leading Jewish family of the city in the years since the synagogue had fallen in to disrepair and then had been demolished.

There are in addition two ornamental stone bowls once located in the synagogue courtyard, and a stone object which is probably the drain-mouth into which water from ablutions was poured. While the memorial stone recording the community's history from the first building of the synagogue in 1163 into the 16th century remained in K'ai-feng, a facsimile copy of it as well as ink rubbings of the original were made for the Royal Ontario Museum.

#### ROTUNDA AND SOCIAL COMMENT

Readers who expect only gentle prose from a museum publication may be in for some surprises as they read the story on page 8. It deals with the Kalahari bushmen of Botswana and has some rather hard social comment to make about the relationship between these natives and white residents, mostly from Southern Rhodesia and South Africa.

Our language is restrained but the message is clear: the native population, and in particular the Bushmen, are severely discriminated against by the dominant white minority, and in what is now their own, independent nation.

Should Rotunda be making such statements? Certainly it would be safer, more comfortable, were we not to. But a contemporary museum, alive to its responsibilities, may not seek such security. It must reflect man's relationship to his world and himself not only in the past, but in the present. And it must speak the truth. Especially is this so in the discipline of anthropology.



#### STUDENT ART SHOW

ROM ART '71, the museum's first outdoor exhibition and sale of original work by art students was both a popular and critical success. Of the more than 400 works available for sale, about half found buyers. And the three judges, Anne Brodzky of *Arts Canada*, Jack Pollock of the Pollock Gallery, and Jack Wildridge of the Roberts Gallery, said they were impressed with the level of much of the work submitted by 75 students of art schools in the area. The students themselves were enthusiastic and are anxious to repeat the event next year.

Six young artists received cash awards of \$100 and \$50. The three winners of \$100 prizes are: Joseph Lieberman for painting and drawing; Richard J. Gill for sculpture; and Michael Robinson for material arts. The three winners of \$50 prizes, for the same categories respectively, are Sheila Rose, Clayton Spanton, and Melanie Martin.

Victor Biasi of Toronto contributed \$300 for the prizes in memory of his brother-in-law, Paulo, who was killed recently in a car accident in Italy.



# CÉRAMIQUES DE FRANCE

The stunning ceramics  
and pottery of France  
from the Middle Ages  
to the Revolution

*by L. Cselenyi*

Centuries of intimate relationship between ceramic objects and man, their creator, have imparted to them a warmth and charm that delights. Small wonder that the ceramic art has become a medium of expression equally suitable for the creation of a simple puppet, a rattle, or figures of gods and goddesses. The shaping of clay gradually became a mirror of human life, reflecting its social customs as well as the continuous changes in its aesthetic sense. It is not unusual that the decorative and utilitarian in the synthesis of modelled sculpture and painting, with its peculiar range of wheel-thrown forms, fire-transmuted material, and colour, often represents abstract art. This artistic expression, however, with its ability to transmit through its particular form and decoration the style of the period, has made its







*CIRCULAR DISH with white and yellow decoration on a blue ground in the "Persian" style. Grand feu technique. Nevers, first half of the 17th century. (Musée des Thermes et de l'Hotel de Cluny, Paris)*

*SUGAR-CASTER with perforated cover, polychrome decoration in five colours (aux cinq couleurs) grand feu technique, in a landscape, with florets, and cross-hatched. In the style of Guillibaud. About 1735. (Musée des Thermes et de l'Hotel de Cluny, Paris)*



own way in the stream of life, sometimes in high repute and favour, at others declining.

The present exhibition is a rare opportunity to see and admire priceless ceramics from France, ranging from beautiful tiles made for the contemplative depths of a Gothic church to objects which achieved such harmony of spirit and style that they were chosen to decorate the luxurious houses of the wealthy. While admiring mediaeval pottery, and masterpieces of the *grand feu* and *petit feu* techniques of faience, the most interesting period of ceramic art in Europe is easily recognized as the late 17th and 18th centuries, when in both technique and material it advanced to the level of the other contemporary decorative arts. The great range of these examples, as well as their historic and artistic value, testify to the fact that ceramics can bring light and life to any interior.

A leading role in the history of ceramics was played by Rouen. Most other factories reflected the influence of its decoration, the most characteristic motif of which was the *lambrequin*. The Rouen master Masseot Abaquesne, in the sixteenth century, first introduced faience into France, and Edme Poterat (1612-82) began the first experiments in soft paste porcelain.

Ludovico Gonzaga, who became duc de Nevers by virtue of his marriage to Henriette de Cleves in 1565, called many Italian artists to his new duchy, among them the Conrade (Corrado) family, the creators of Nevers faience. The strong Italian influence visible, for example, in the *istoriato* decoration using biblical and mythological motifs, changed during the seventeenth century, and gradually developed into the Franco-Nivernais style, favouring pastoral themes. The development of coloured grounds was still more original, and flowers and figures in the "Persian" style were highlighted in white and yellow against an intense blue. Chinese motifs were painted in a blue monochrome heightened with manganese purple on a slightly bluish ground. In the eighteenth century more popular wares known as *faïences parlantes* came into favour. The influence of Nevers was felt not only in nearby centres but by manufacturers throughout France.

In the middle of the eighteenth century a new style began to develop. The Rococo, besides its typical characteristics of form and design, first imitated oriental floral decoration,

*TUREEN in the form of a turkey-cock. Polychrome decoration. Petit feu technique, showing the extraordinary virtuosity of French faience manufacturers. Strasbourg, by Paul Hannong, about 1755. (Musée des Thermes et de l'Hotel de Cluny, Paris)*

*TRAY with lobed rim outlined in gold. Gilt-feathered Rococo handles, with polychrome decoration of a central oval medallion. Two reserves with rustic scenes on a blue and gold ground on the rim. Mark of Vieillard. Sèvres. About 1788. (Salomon de Rothschild Foundation, Paris.)*







which gradually became naturalistic. The roots of this evolution are to be found also in the invention of the *petit feu* technique, which allowed painting on the surface of an already fired ware, the decoration being fixed by a second slow firing. The process was introduced in Strasbourg about 1740 by Paul Hannong, son of the factory's founder. His brother Joseph, manager of the factory until 1782, put out a prodigious amount of porcelain decorated with the famous "Indian flowers" and the more delicate naturalistic floral decoration called "Strasbourg flowers." The style and *petit feu* technique were soon adopted by such factories as Niederviller, Sceaux and Marseilles.

The Vincennes factory was founded in 1738. Following a grant of financial aid from the king, it assumed the title of Manufacture Royale. The early production shows the influence of the Far East as secondary to the influence of Meissen. French taste found its expression in blue or pink monochrome decoration, while biscuit was created after the sculptor Bachelier proposed that the paste

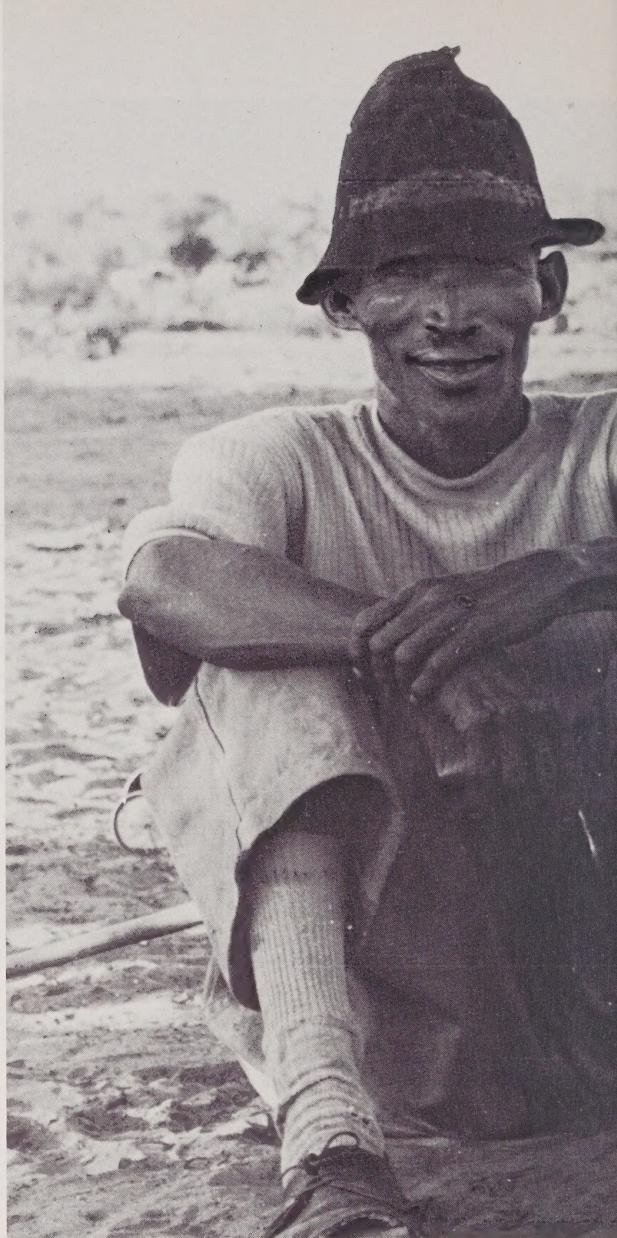
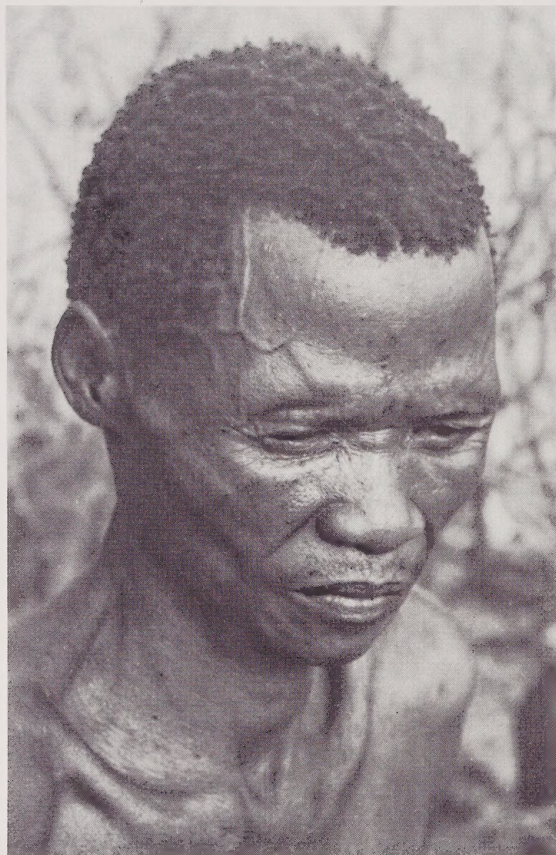
should be left unglazed for the sake of greater delicacy of modelling.

In 1756 the Vincennes factory was installed. Great artists such as the sculptor Falconet and the king's goldsmith Duplessis were employed at Sèvres. While the spirit of Vincennes was preserved, the porcelain of Sèvres attained an incomparable degree of excellence. Each year services were produced in an infinite variety of colours and decoration. Almost equally important were sets of vases in various forms, sometimes decorated with daring originality of taste and executed with stunning virtuosity. The diversity of style of its soft paste porcelain was a startling achievement, and is the reason for its fame not only in France but throughout the world.

*The exhibition Céramiques de France, now at the Royal Ontario Museum, is organized by the French Government by arrangement with the Cultural Affairs Division of the Department of External Affairs. It is co-ordinated by the National Gallery of Canada, Ottawa.*



*Photographs by the author.  
Faces of the Nharo Bushmen.*



The Ethnology collection of the Royal Ontario Museum now includes items of Kalahari bushman material culture. The 40 items were collected during field work among Nharo bushmen in the Ghanzi district of Botswana in the northwestern Kalahari between October 1968 and April 1970. Individually the material seems unexciting and mundane; however, together they graphically demonstrate the cultural conflict and social regimentation of the illiterate people of that area.

The Nharo bushmen are just one of a number of Bushmen linguistic groupings in the area. There are, in addition, Hottentot,





# KALAHARI BUSHMAN IN TRANSITION

*by Mathias G. Guenther*



*Farm Bushman dwellings  
of cow-dung, sand and wattle  
with thatched grass roofs.*

*Farm Bushman kraal.*





Coloured and European groups. The high degree of diversity in the district is reflected in the collection, which contains items the Nharo had secured from other Bushmen groups such as Kaukau (Auen), Tssaukwe and /gwikwe; from African Bantu tribes such as Tswana, Kgalagari and Herero; from a few Hottentot of the Nama tribe and from Europeans who are English- and Afrikaans-speaking South Africans and, finally, from Coloured who are offspring of mixtures of all these groups.

The Bushmen and many of the Africans and Coloured live as labourers on the European cattle ranches, while about one half of the African and Coloured population also live on their small farms and in villages in the south-western part of the district.

The Bushmen own no land and are economically dependent upon the Europeans and, to a lesser extent, the Africans. Cattle have driven out wild game, and hunting has been reduced almost exclusively to the snaring or trapping of small antelopes and rodents. The women still practise the gathering of plants, although the yield is much reduced. Plant lore—both of food and medicinal plants—is thus extensive, while hunting skills have become limited. Only few farm Bushmen can still hunt with bow and arrow.

The Europeans, although vastly in the minority, are the most powerful, prestigious and wealthy group in the district. They came to the area at the turn of the century as pioneer settlers from the Transvaal, and own most of the land freehold in the farming district in the northeast of Ghanzi. Relations between the Europeans and Bushmen, as well as other non-Europeans, are strained and tense. The farmers have taken the political ideologies of their native South Africa into a country which in 1966 gained independence and has become a multi-racial African nation deeply opposed to segregation.

Much of the Bushman's material culture consists of common everyday European items. Visibly and materially they do not reflect the material culture of the other people to any great extent; nor do they reveal any other aspects of the native culture. However, they



*The women's pouch, below, is traditionally Bushman and beaded with fragments of ostrich shell. The pouch above is decorated with 'European' buttons and store-bought beads. Photo Leighton Warren.*



do reveal a great deal about many non-material social aspects.

Of the 40 items in the collection, 20 are derived from European and African cultures. Either the whole concept and method of making the item is taken over (for example, some musical instruments such as the dengo or European-style guitar), or the traditional concept has been retained but the item is made from European objects and materials such as wire, thread, tin cans, cloth. There are musical instruments in which the string is made from wire instead of sinew. Ornaments are made from store-bought glass beads instead of ostrich-egg shells; clothing from material rather than skins; sandals of car-tire soles and inner-tube thongs rather than leather. Pipes are made from empty rifle cartridges or bent tin from empty food cans instead of bone.

Some of the "pure" traditional Bushman items in the collection—poisoned arrows, assegais, skin blankets and clothing (especially women's clothing)—are used regularly only by the Bushmen at the periphery of the district, and very little by the farm Bushmen proper. The rest of the traditional Bushman items are used regularly. However, seven of these twenty traditional practical items—wooden and tortoise shell spoons, fur hats, ostrich eggshell containers, small woven baskets, bone pipes, skin aprons and, to some extent, snares—are less preferred than the appropriate European items, which are used instead whenever they become available. Steel traps, for instance, are preferred to snares. The hunting bow is not included in the collection because its use is now so restricted that not one specimen could be obtained.

The collection represents an incomplete toolkit of the Ghanzi farm Bushmen. It is supplemented, in life, with many European items, primarily articles of clothing which are invariably torn and old and various sizes too large, since they are cast-offs from European farmers. Blankets, tools, kitchen implements, riding and herding equipment such as reins, saddle, sjambok or whip, stirrups, and such men's items as lighters, pipes, brown packaging paper for rolling cigarettes and women's items

*Farm Bushman articles. The carved wooden spoons are of Bantu origin; ostrich-egg water bottle, mortar and pestle and quiver are traditionally Bushman, as is the toy bow at the right. The musical bow (behind mortar) is strung with European wire.*

*Dancer's paraphernalia (below) not yet influenced by other cultures: gnu-tail fly whisk, goat-skin cap, headband of Bushman-made beads, and leg-rattle.*

*Photos Leighton Warren.*





as safety pins, green laundry soap, baby bottles and soothers, knitting and sewing equipment and glass beads are all European.

Practical items, if not European, are predominantly European-derived, and only a fraction of the practical tool-kit is that of the traditional culture. Non-practical items, however, are almost exclusively traditional. Games, musical instruments, ornaments and ritual objects appear more resistant to change than practical items. One feasible reason for this is the fact that they are more closely linked with a level of culture which is generally the last aspect to change, lagging behind changes in other aspects of society.

Although the European, and African, neighbours of the Bushmen have allowed them entry

into their society in terms of economics—as farm labourers or serfs—they maintain rigid barriers against potential intrusions into other spheres of socio-cultural interaction. Some European farmers, for example, are strongly opposed to mission work among Ghanzi farm Bushmen because it would introduce them into the European belief system. The Bushmen's economic entrance into European society is felt to present no threat to the wealthy Europeans. Moreover, it permits "neutral" interaction which does not threaten to compromise the European charter. In terms of values, norms and beliefs, then, the rigid exclusion of the Bushmen leads to the retention of their own values, norms and beliefs, and the manifestations of these in material culture.





During the three generations of contact with Europeans, the farm Bushmen have attained a condition of marginality vis à vis the traditional veldt Bushmen and the Europeans. Their attitude to the latter is one of ambivalence: a mixture of aversion, because of harsh dominating treatment from the Boers, who strictly uphold a master-servant relationship—and of emulation, because of the prestige, wealth and political power wielded by the Europeans. While emulating European technological advancement and cleverness, the farm Bushmen extend contempt, derision and

rejection toward the veldt Bushmen with whom, however, they are racially and culturally one, and with whom they are identified by the Europeans.

The farm Bushmen thus have one foot in European society and culture and one in traditional Bushman society. Ambiguity and ambivalence exert considerable emotional pressures on them. They display the “marginal personality” of restlessness, intensified self-consciousness, hypersensitivity and most pronounced feelings of inferiority to Europeans.

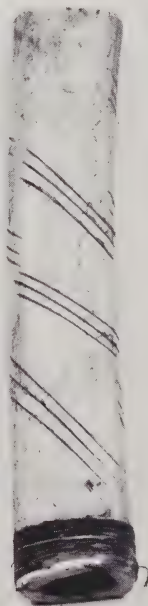
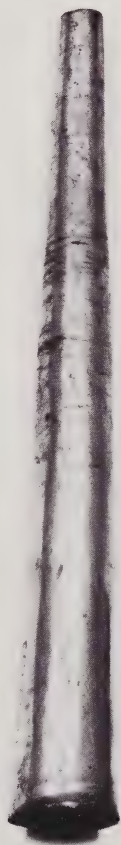
In the light of these social factors, the ac-



*Perfume boxes among nomadic Bushmen women were made from tortoise shells; as the nomads became herders, goat horn came into use.*

*Three pipes: rolled metal from a food tin; a spent cartridge, and the traditional carved bone.*

*Photos Leighton Warren.*





quisition of European items of material culture can be more fully appreciated. That such items are greatly coveted and eagerly sought after and accumulated, not only for possession but also for trade and exchange, cannot be accounted for solely on such functional criteria as economics and practicality. The European goods objectify the Bushman's attainment of certain aspects of a way of life to which he is drawn and from which he is excluded.

The acquisition of "unpractical" items — broken flashlight shells, dead batteries, non-functioning watches, broken coal-oil lamps and lighters—makes similar sense. In one case, the shell of a mid-40s Ford truck, on which only the steering wheel and the four wheels perform their function, when drawn by a team of eight donkeys, accorded its Herero owner great prestige. Similarly, the wearing of seemingly non-functional items of clothing such as socks without soles, felt hats consisting only of the rim, torn pieces of underclothing including much-too-small brassieres for the immensely endowed Bushman women, all are regarded as prestige markers. So is the unqualified preference over traditional foods of all European

foods, which have received a linguistic term of their own.

Moreover, the type of European items which non-Europeans — all of whom emulate the Western way of life — can acquire serves to accentuate the distinctions between the various non-European groups in the district. Thus, the Coloured people, some of whom are relatively wealthy, can own small ranches, European-type houses and trucks. Africans and Bushmen cannot. Africans, however, can own new clothes, radios, watches, coal-oil lamps, donkey carts, guitars and ploughs. Only few Bushmen own such items. Their European possessions are usually cast-off clothes; if they possess such items as watches, flashlights and lamps, they are usually broken and have been traded from their previous possessors, usually Africans. For example, while the European (and some Coloured) means of locomotion and transportation is the truck, that of the African is a cart, usually made from parts of old, broken-down trucks that have been discarded by the Europeans, while the Bushman has to make do with the donkey-drawn sleigh made from wood.

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Mathias Guenther's article on the Nharo farm Bushmen grew out of fieldwork in the north-western Kalahari, the Ghanzi district of Botswana, which was financed by Province of Ontario and Canada Council fellowships. Mr. Guenther, who was born in East Germany in 1942, was studying the problems of incorporation processes of the Bushmen of Botswana. At the same time his wife, a registered nurse, operated a small clinic among the Bushmen and other peoples of the area. Mr. Guenther is presently preparing his doctoral dissertation in social anthropology for the University of Toronto.







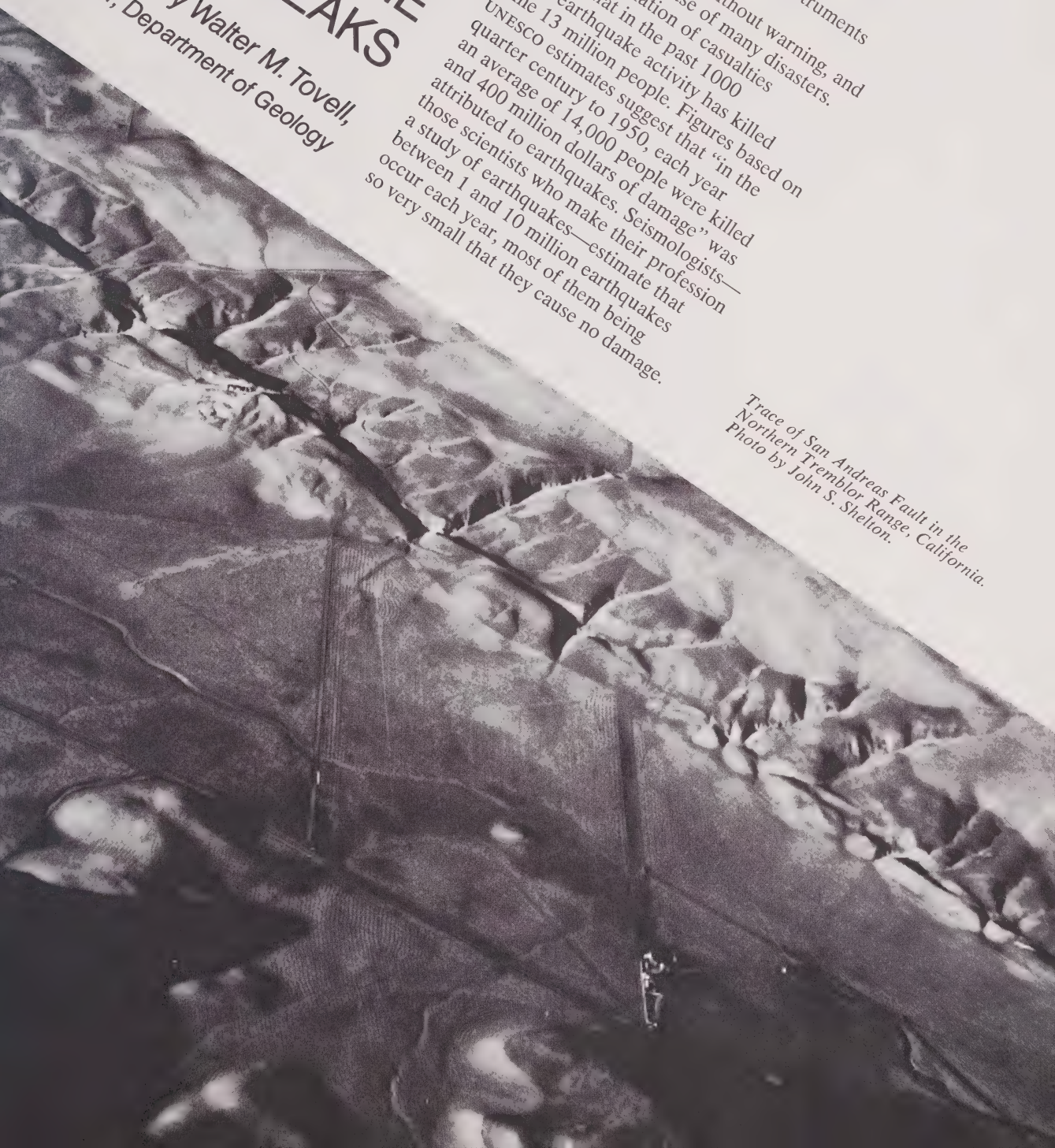


# WHEN THE EARTH SPEAKS

by Walter M. Tovell,  
Curator, Department of Geology

The earth speaks with earthquakes; the apparent language is violence and death, but instruments detect many a quiet one. Earthquakes strike without warning, and have been the cause of many disasters. A rough tabulation of casualties suggests that in the past 1000 years, earthquake activity has killed some 13 million people. Figures based on UNESCO estimates suggest that "in the quarter century to 1950, each year an average of 14,000 people were killed and 400 million dollars of damage attributed to earthquakes—estimate that those scientists who make their profession a study of earthquakes—estimate that between 1 and 10 million earthquakes occur each year, most of them being so very small that they cause no damage.

*Trace of San Andreas Fault in the  
Northern Tremblor Range, California.  
Photo by John S. Shelton.*



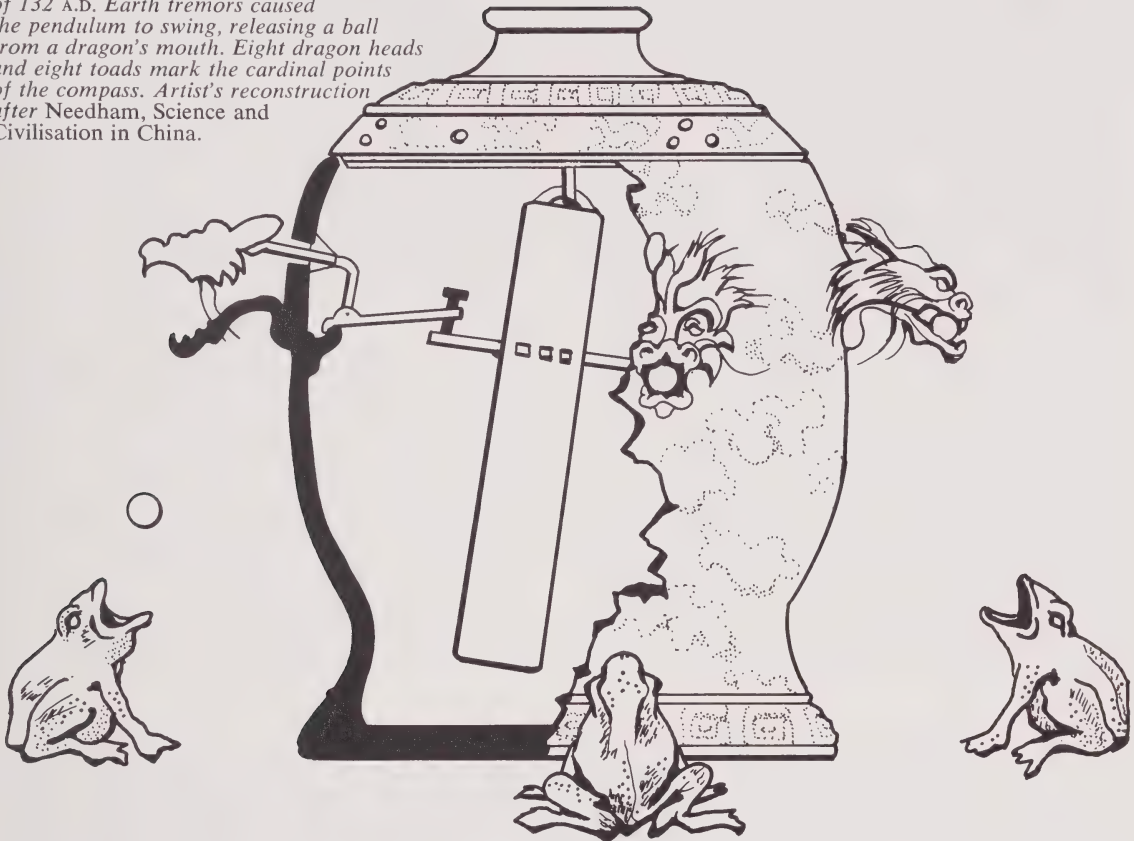




*Structural damage  
after the San Francisco  
earthquake of 1906.  
Courtesy  
California State  
Division of Mines.*



*Chang Heng's "earthquake weathercock" of 132 A.D. Earth tremors caused the pendulum to swing, releasing a ball from a dragon's mouth. Eight dragon heads and eight toads mark the cardinal points of the compass. Artist's reconstruction after Needham, Science and Civilisation in China.*



and can only be detected instrumentally close to the spot where the earthquake occurred. In Canada, in 1962, Canadian earthquake recording stations identified 3,470 separate earthquakes scattered around the world.

Our ancestors felt that earthquakes were inflicted by a vengeful god, as punishment for their sins. John Wesley wrote, "there is no divine visitation which is likely to have so general an influence upon sinners as an earthquake," and considered a small earthquake, such as the one that rocked Manchester, England, in 1777, "no undesirable event," since it was recognized as a symbol of divine vengeance!

While religious and superstitious beliefs dominated earthquake literature, some natural philosophers did attempt to search for a cause other than the weight of guilt. In the Mediter-

ranean world, the Greeks believed "that earthquakes were caused by excess water from the upper regions bursting into the under parts and hollows of the earth," while in China, about 100 A.D., "the chief cause of earthquakes is air, an element naturally swift and shifting from place to place," imprisoned in the earth.

The Chinese kept extensive records of earthquakes. Between 780 B.C. and 1644 A.D. they listed 908 shocks. The greatest of these occurred on February 2, 1556. Eight hundred thousand people are said to have perished as a result. In spite of this great seismic activity in China and neighbouring Japan, not until 1891 was the first really important observation and deduction drawn with respect to the *cause* of earthquakes.

On October 28, 1891, at 7:30 a.m. one of the severest of all Japanese earthquakes struck.



It was felt over the entire main island. Within an 11,000 square mile area around the centre of the quake, 7,300 people were killed and 200,000 houses destroyed.

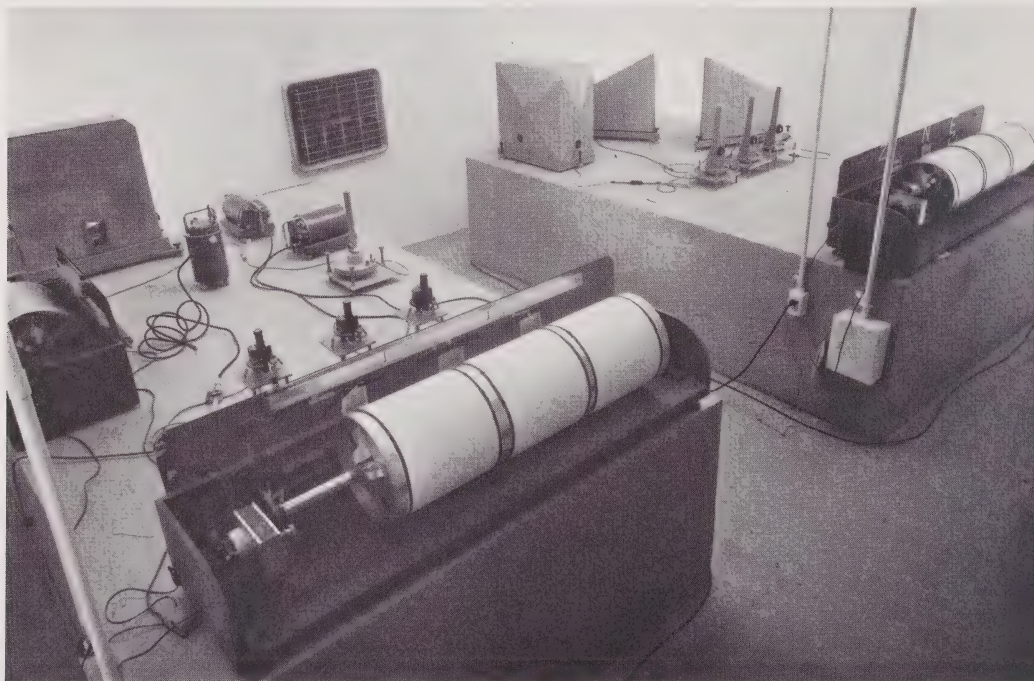
Immediately following this quake, on-the-spot investigations in the epicentral area—the area where the quake was centred—revealed the presence of a 60-mile-long break—a fault—in the ground and that, at the instant of the earthquake, “roads, fences and rows of trees that had cut across the break, were shifted sideways.” It was also found that a spectacular 20-foot vertical and 13-foot horizontal displacement of the earth’s surface had taken place.

The principal investigator, named Koto, asked himself two questions: “Was the earthquake the result of a segment of the earth’s crust dropping, and hence causing the quaking of the earth?” or “Were forces operating within the earth, causing the rocks to break, with energy being released by a rupturing of the rocks?” Koto theorized, correctly, that the

latter was the case, and a new era of earthquake study—seismology—began.

Koto’s theory was confirmed by the investigations following the San Francisco earthquake of 1906. These studies led to the recognition of the great 600-mile long San Andreas Fault in Southern California. At the instant of the San Francisco earthquake, horizontal movement averaging 15 feet took place along a 190-mile length of the trace of the fault; at one place the movement measured 21 feet, and nowhere was the vertical displacement more than three feet. These observations led the investigating geologists to conclude that “it is impossible for rock to rupture without first being subject to forces which distort it.” Amongst the largest ground movements ever recorded were in Alaska, in 1899, when after a major earthquake, a vertical movement of 47' 7" was measured near Yakutat, on the coast of Disenchantment Bay.

The recognition of the association of active faults with earthquakes, and the deduction that rocks rupture as a result of forces within the





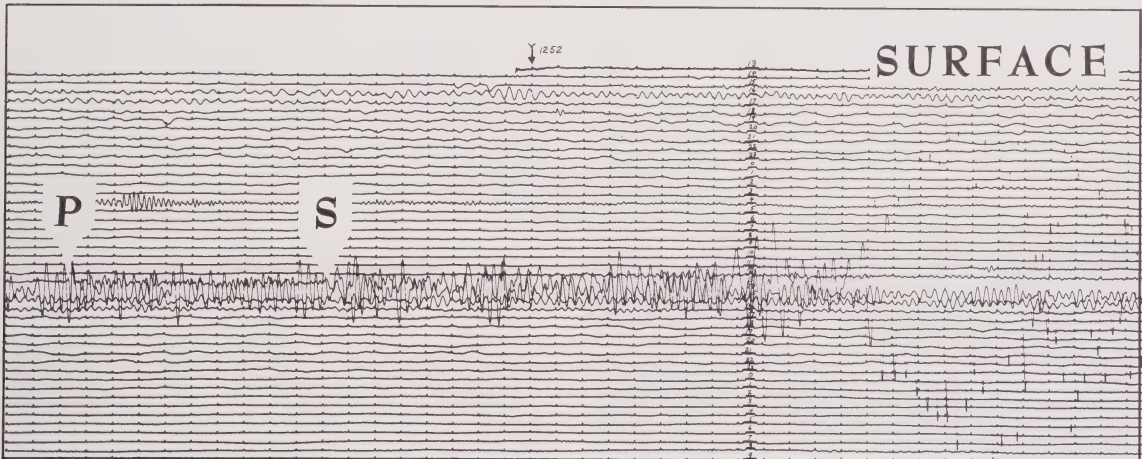
earth, are only two parts of the earthquake story. Centuries before these conclusions were reached, the earthquake activity of China had led to the first attempts to record earthquakes by instruments.

Chang Heng, in 132 A.D., devised "an earthquake weathercock," or in other words a seismograph. His instrument consisted of a cast bronze vessel some six feet in diameter, inside of which was a central column "capable of lateral displacement along tracks in eight directions and so arranged that it would operate a closing and opening mechanism." The basic operation of the instrument was that of a pendulum which, activated by earthquake waves, hit a ball held in the mouth of a dragon. The ball "was vomited out . . . and caught by a toad underneath," supposedly indicating the direction in which the earthquake occurred. An array of eight dragons and eight frogs surrounded the vessel.

Modern instrumentation for the recording of earthquakes, however, began about 1880 when the Emperor of Japan who had had

earthquakes "for breakfast, dinner and supper and to sleep on" summoned an English mining engineer, John Milne, to begin a serious investigation of earthquake phenomena in Japan. Milne designed the first modern seismograph—an instrument capable of detecting the quiet language of the earthquake and resolving the violent language.

From Milne's beginning, seismographs have been improved and deployed over the earth's surface. Some record on magnetic tape, others on photographic film. Today the United States operates a network of 115 stations in 61 countries, all using similar instruments. Canada's 28 stations, using instruments compatible with the U.S. international network, are so distributed that no location in Canada will be more than 300 miles from a first-class seismograph station. Other countries have comparable and compatible networks. The goal—a better "knowledge of the earth's internal structure, an understanding of the causes of earthquakes and mountain building, and a means of earthquake prediction."



*Earthquake record, showing P, S and surface (L) waves. Courtesy Seismology Div., Earth Physics Branch, Dept. Energy, Mines and Resources.*

*Interior of the Ottawa seismic vault. On the pier at the right three long-period Columbia seismometers are recording on a three-component drum. The pier at the left has three Willmore short-period seismometers, one mounted vertically and two horizontally. Courtesy Seismology Div., Earth Physics Branch, Dept. Energy, Mines and Resources.*



The quiet, as opposed to violent, language of an earthquake is written on a record called a seismogram, and identified as "P", "S" and "L." These letters are given to the three principal types of waves that result from an earthquake. Such waves disperse energy in the same general way that waves on water disperse energy along the surface of the water when a stone is thrown into it. If the quake is large enough—that is, emits enough energy—the earth will actually vibrate like a bell, with a period of 54 minutes.

The letters "P", "S" and "L" stand for Primary, Secondary and Long. Primary waves travel the fastest from an earthquake centre within the earth called the focus, and thus are the first to be recorded on a seismogram. Secondary waves are slower, and appear on the record after the P waves. Both P waves and S waves travel *through* the earth, and move very quickly—between 5 and 10 kilometres per second. The L waves are slower, and travel *around* the earth just beneath the earth's surface.

From studies of seismograms, it appears that mother earth is like a hard-boiled egg, with a yolk (the core), a white (the mantle) and a shell (the crust). The records lead not only to this picture of the earth's interior, but also by analysis yield data on the nature of the interior—whether the materials are solid or liquid. The most fundamental development of these studies was the recognition that there are marked discontinuities within the earth. In other words, the boundary between the crust and the mantle (the Moho Discontinuity) is sharp, as is the contact between the core and the mantle.

Once the earth's interior had been mapped and the mechanism and origin of earthquakes established, an overall theory of how the earth works could begin to evolve. In the early 1900s, a meteorologist, Wegner, suggested that the continents were "floating," and that they were once one, and had moved apart. This is the concept of "continental drift."

As is the way with theories in the Earth Sciences, the burden of proof for a theory such as continental drift is often a long time coming.

Much of the proof for "continental drift" actually comes from the geographic distribution of the epicentres of earthquakes and the depth of focus of earthquakes. The geography of earthquakes indicates quite clearly that the world has belts of seismic activity. The most active is the circumpacific belt, with other active zones through central Europe, central Asia and along the middle of the Atlantic Ocean. When the depths of foci are studied in detail, it becomes clear that with minor exceptions the earthquakes having the deepest foci are in the circumpacific belt. In an area like South America, the earthquakes with shallow foci are along the Pacific border of the continent, while those with a deep focus lie eastward from the Pacific border under the continent. Since it is known that earthquakes result from faulting, it can be deduced that the South American continent is being shoved towards the Pacific Ocean basin on a system of faults. Similar deductions can be made for other areas.

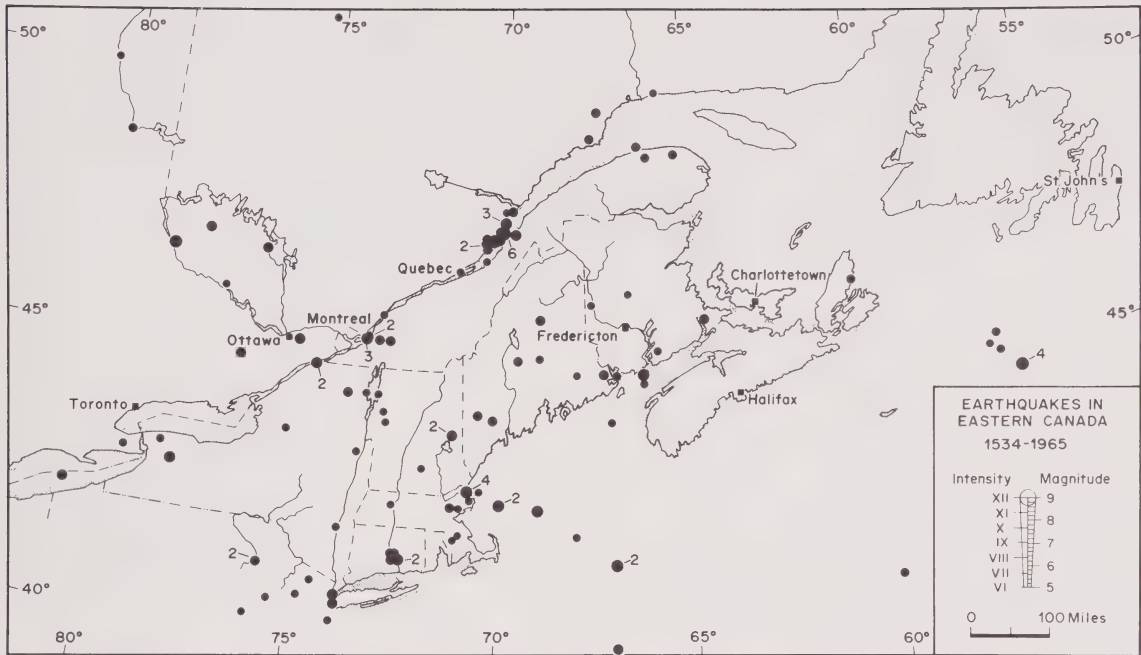
Studies of the earthquake zone of the mid-Atlantic indicate that the quakes are shallow, with focal depths of less than 44 miles. These data, combined with others, suggest that the earthquake activity of the mid-Atlantic is due to the pulling apart and spreading of the ocean floor.

And where does Canada fit into this pattern? Our West Coast has had numerous earthquakes. However, the evolution of the West Coast is further advanced than for instance that of the Aleutian Islands to the north or South America to the south, and seismic activity is not as marked as in these two areas. Earthquakes do, however, occur and several rate with the largest in the world.

Canada's eastern areas also have earthquakes. So far as we know, these quakes are not related to the drifting of the continents, but rather to vertical movements of the earth's crust. Such vertical movements have been suggested as being due to differential rise of the earth's crust following glaciation, in much the same way as a floating wooden board rises in the water when a load is removed from it.

Whether this suggested mechanism is right



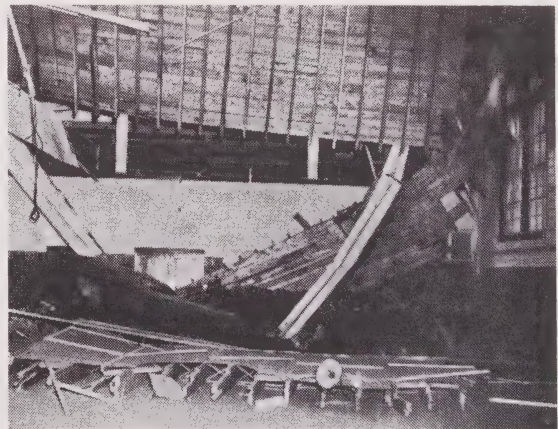


or wrong, large earthquakes have occurred in eastern Canada. The largest ones were in 1925, with the centre at the mouth of the Saguenay River where it enters the St. Lawrence; in 1935, when a large earthquake was centred near Temiskaming, Quebec, and in 1944, one in the Cornwall-Messina area. The size of these earthquakes was comparable to many damaging quakes that occur in California.

The map shows the latest compilation of the distribution of earthquake-prone areas of Canada. This map—an earthquake (seismic) zoning map—is a *statistical* map in that it shows the *chances* of an area being hit by a quake, and the *chances* of the earthquakes being large or small. In general, the No. 3 zones are most likely to be hit with a large earthquake. A similar sized earthquake might take place in the No. 2 zone, but the chances of doing so are less. Nevertheless, the Temiskaming and Cornwall-Messina quakes, two of the largest known in eastern Canada, occurred in the No. 2 zone. The large white area indicated 'O' means that there is practically no chance of an earthquake in this area. Sum-

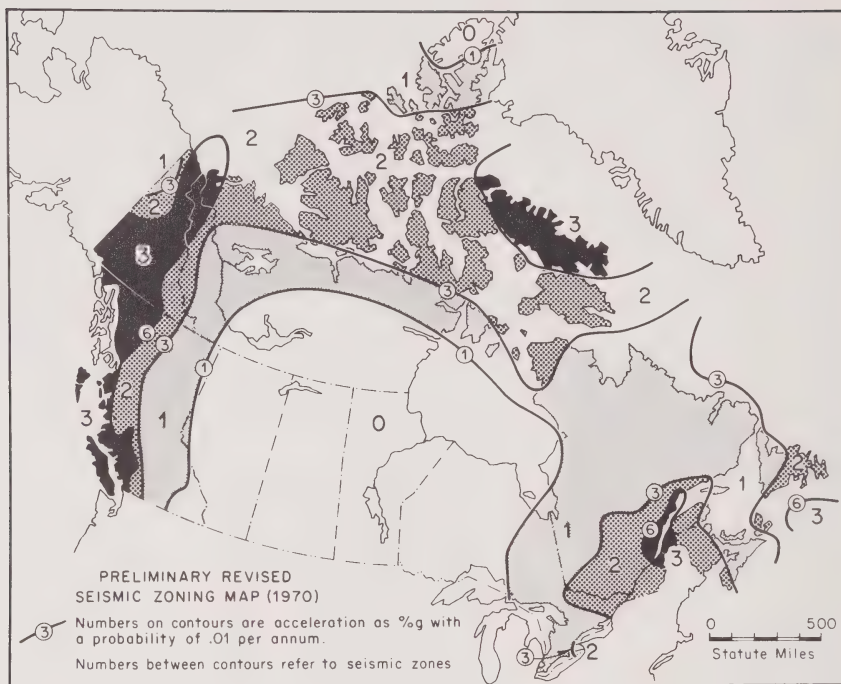
*Earthquakes in Eastern Canada between 1534 and 1965, with magnitudes equal to or greater than 5 on the Richter scale. Montreal, for example, has had three recorded quakes. Courtesy Seismology Div., Earth Physics Branch, Dept. Energy, Mines and Resources.*

*Earthquake of 4 September 1944 collapsed the roof of a Cornwall high school. The quake occurred when the school was not in use. Courtesy Seismology Div., Earth Physics Branch, Dept. Energy, Mines and Resources.*





*Seismic zoning map for  
Canada, 1970 (see text).  
Courtesy  
Seismology Div.,  
Earth Physics Branch,  
Dept. Energy,  
Mines and Resources.*



marizing the map, Canadian seismologists state:

“... It should be emphasized that the seismic zoning map estimates the areal distribution of seismic hazard, and is not concerned with the detailed prediction of specific earthquakes. No inferences can be

drawn from it regarding specific times, locations or sizes of specific earthquakes.”

This statement could be written for almost any area of earthquake activity, although in highly active areas like California, great efforts have been, and are being, directed towards establishing a prediction system.



The range of Walter M. Tovell's activities is vast. He has been Curator of the ROM's Department of Geology since 1948, and has undertaken geological surveys on pack horse and by helicopter. He has also worked on sampling and coring programmes on Lake Huron and Georgian Bay with the Great Lakes Institute. In addition, Dr. Tovell has written extensively for popular and scholarly publications.



## The Growing Collections

The Far Eastern Department's major acquisition for this year is a Chinese gilt-bronze image of the eleven-headed Kuan-yin, probably dating from the 7th century or early T'ang Dynasty. Though less than ten inches in height, the statuette's fine workmanship and rarity as a sculptural type give it an importance equal to that of monumental works from the period. The bodhisattva's multiple heads symbolize his ability "to see and hear all in the world." Their arrangement as a crown above the main head (in successive tiers of five, three and one, with a larger version appearing at the back) is unusual, known in only one other example preserved in a Japanese private collection. The deity's attribute of a water-bottle containing heavenly nectar held in his left hand is standard. His right hand, by contrast, should grasp a long-stemmed lotus, but holds instead what seems to be a scarf-end. Iconographical elements and details of costume originating in India, the source of Buddhism, had become imperfectly understood by

Chinese interpreters of the religious tradition.

Stylistically, this work's use of scarves to form an ornamental openwork pattern framing the figure, and the architecturally complex double-lotus socle and stand, reach back to later 6th century modes. Its massive head and subtly sensuous body, on the other hand, anticipate the lush plasticity developed in the 8th century. Our small sculpture provides a remarkable example of transitional movements from "classic" to "baroque" phases of Chinese Buddhist art.



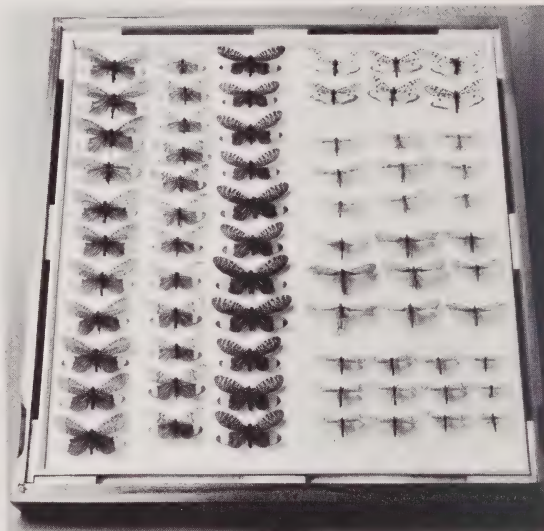
An Iroquois water drum with stick, a significant addition to the collections of the Ethnology Department, was donated by Mr. Logan Sherman. This drum was acquired from the Onondaga Reserve, Medrow, New York in 1930 and made by Jesse Lyons. Originally drums were prepared from tree knots by burning and with a head of woodchuck skin (Fenton). Drums have also been made for a century or more from butter tubs and paint kegs. The pitch of the drum is controlled by the water level in the keg and the tightness of the skin. The beater is carved to fit thumb and forefinger and has a small wooden ball which sets up an echo beat.





The Department of Entomology and Invertebrate Zoology recently acquired an important collection of adult Trichoptera (Caddisflies).

Adult caddisflies are moth-like insects, and secretive in their habits, but the larval stages inhabit all types of fresh waters, where many of them construct cases or shelters of rock fragments or plant materials. The material, numbering nearly 5000 specimens, represents the most complete assemblage of the world's fauna of two families (Limnephilidae and Phryganeidae) available in a single collection. The collection was assembled by Dr. Fernand Schmid, formerly of Lausanne, Switzerland, and now with the Entomology Research Institute, Canada Department of Agriculture, over a period of some 25 years. Many of the specimens were gathered by Dr. Schmid during a five-year expedition to the remote mountain ranges of northern India (in the photograph, the three left-hand rows of dark-winged specimens are examples). A number of species new to science are represented in the collection. The two families purchased by the ROM are significant assets to a research project of the entomology department on caddisflies, in particular the immature aquatic stages.



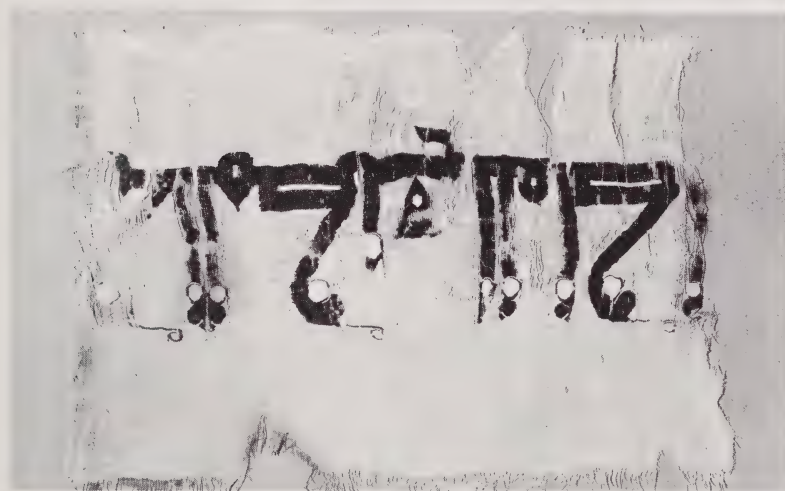
About 250 mineral specimens have been acquired by the Department of Mineralogy since November 1970. Fine specimens of berthierite and semseyite from Roumania, neptunite (illustrated) from California and a large 4-inch almandine crystal from Rhodesia were purchased. Dr. D. D. Hogarth of Ottawa kindly presented a specimen of the new, rare mineral wakefieldite. Mr. Frank Melanson donated a

superb example of clear, orange grossular from Asbestos, Quebec; and a magnificent specimen of sphene on an attractive matrix, from Tory Hill, Ontario was acquired by exchange from Mr. Ed Hriskow. A collection of 22 chemically analysed minerals of the Clay Group, with their X-ray diffraction and differential thermal data, was presented by the Manitoba Mines Branch through the courtesy of Mr. B. Bannatyne.

A carved opal weighing 70.60 carats was purchased for the gem collection. Carved opal is scarce and this beautiful specimen features a dragon, a temple and a peacock. The opal, one of the finest examples we have seen, is Australian and was carved in China. In addition, 102 micromounts have been acquired. Included in these is a collection of 12 gold specimens from Nevada, the gift of Mr. Del Oswald of Pittsburgh. Four beautiful diamond crystals were given by Mr. Paul Seel of Philadelphia. About fifty of the new "micros" were mounted here in the Museum and feature some rare crystals from St. Hilaire, Quebec, such as epididymite, leucophane and villiaumite.



The ROM has recently been able to add a few examples of tiraz fabrics to its collection of mediaeval Islamic material. These were woven in the royal workshops known as tiraz for presentation to courtiers and supporters, and are noted for the fine tapestry-woven inscriptions that often bear the name of the ruler. The example shown bears the name of the Abbasid Caliph al-Muti' (946-974) and was probably made in Egypt.



The ROM has an outstanding collection of the so-called "dragon robes" that were worn at the Imperial Court of China during the Ch'ing Dynasty. The decoration of this formal attire represents the universe, and was strictly laid down in sumptuary laws. Across the lower edge, mountains rise from the waves and billows of the sea; above are the heavens with dragons, beneficent creatures, chasing flaming pearls among the cloud-filled sky.

The robes reserved for the use of the emperor alone also carried the twelve symbols of Imperial power. Some of these may be seen in this splendid example that probably dates from the reign of the Chia Ch'ing Emperor (1796-1821). It is the ninth of these rare robes to reach the Museum, and is the generous gift of Mrs. Edgar J. Stone.



The Greek and Roman Department acquired a group of about two dozen pieces of pottery found in the region of Ortona in southern Italy ranging in date from the late sixth to the third century B.C. and comprising both local Italic and South Italian Greek examples.

Outstanding among the latter and rivalling in quality its Attic counterparts is an Apulian stemless cup in brilliant black glaze with stamped rosette decoration. Noteworthy is a composite vase of about 300 B.C. in the local Canosan style consisting of four small jars with black and red decoration: one of the jars still contains a pink pigment which may have been used for cosmetic or some other decorative purposes. The native Italian potters' characteristic taste for bizarre shapes is illustrated by a small Daunian bowl whose stemmed support rests on three whimsical feet.

The collection of Roman portraits has been significantly enlarged by the addition of a terracotta head of a young man. The excellently preserved life-size head is a recent chance find off the south coast of Sardinia and may have originally belonged to a full-length statue. After the ROM Conservation laboratory removed heavy incrustation, the head emerged as a crisp and lively work whose individualized features, such as a prominent aquiline nose and asymmetrical face, distinguish it as a true portrait of a particular person rather than merely a type. The stylistic factors point to a date in the second half of the first century B.C., making the man a witness of the turbulent last days of the Republic with the murder of Caesar and the rise of Augustus to imperial power.





## Recent Publications

Just published: a short history of the life of W. A. Parks, distinguished scholar and teacher, founder of the palaeontological collections in the ROM, and first Director of the Royal Ontario Museum of Palaeontology. Dr. Parks was the first person to receive the degree of Doctor of Philosophy in Geology in Canada. (WILLIAM ARTHUR PARKS Ph.D., LL.D., F.R.S. 1868-1936; Madeleine A. Fritz, Life Sciences Miscellaneous, \$1.50 paperbound)

Four articles from past issues of ROTUNDA are now available in reprint form. *Forgery: Who Signed Bartlett's Name?* (Vol. 1 no. 3) by Mary Allodi of the Canadiana Department tells of the discovery that Canadian sketches done by John Richard Coke Smyth had been given the signature, "W. H. Bartlett." Connoisseurs of Canadian art history will enjoy a sketching trip west from Toronto to Wisconsin in 1845, in *Paul Kane's Sketches* (Vol. 2 no. 1) by Kathleen Wood of the Department of Ethnology. "Wearing such a sword, one can slay the barbarians"—the tribute of a Chinese poet to the treasure swords of Japan—inspired David Pepper's *Such a Sword* (Vol. 2 no. 3), a discussion of the finest and most beautiful blades ever produced. ROM Chief Biologist Loris S. Russell's *Those Remarkable Dinosaurs* (Vol. 4 no. 1) tells of the fascinating creatures of the Age of Dinosaurs, and speculates on how and why they became extinct. (Each ROTUNDA reprint, 50¢)

Other recent publications of general interest: *NEW GUINEA: BIG MAN ISLAND* by E. S. Rogers (1970) 24 colour photos, hardcover, \$9.95; the culture and peoples of the second largest island in the world.

*THE PLANET VENUS* by H. C. King (1970) 75¢; discusses the planet most like the earth in size and in relation to our Sun.

*FROM HERE TO INFINITY* by H. C. King (1970); 75¢; the history of man's conceptions of the universe.

*FORGOTTEN PEOPLES* by E. S. Rogers (1969) \$3.00; an overview of the cultures of the preliterate peoples of the earth.

*HAUTE COUTURE* by K. B. Brett and the Fashion Group Inc. of Toronto (1969) \$4.00; notes on designers and their clothes in the collections of the ROM, with a history of fashion in the past eighty years.

*THE ARMOUR COURT OF THE ROYAL ONTARIO MUSEUM* by Jean Bacso (1970) 75¢; a discussion of arms and armour from mediaeval times, illustrated from the ROM collections.

*THE GALLERY OF MINERALOGY—A GENERAL GUIDE* (R. I. Gait and V. B. Meen) and *A GUIDE TO THE TEACHING SECTION* (R. I. Gait) (1968) \$1.00 the set.

*THE BISHOP WHITE GALLERY* (1969) \$1.25; illustrates Shansi wall paintings and sculptures from the Chin and Yüan Dynasties in the ROM collections; seven colour plates.

*THE EAST ASIAN GALLERIES* by Doris Dohrenwend (1969) \$1.75; the art of China, Japan, India and other East Asian countries with reference to the outstanding collections housed in 22 ROM galleries.

All these publications may be obtained from the ROM Book and Gift Shop, 100 Queen's Park, Toronto 5. When ordering by mail, please include in your cheque or money order 25¢ to cover packing and postage.





*Glass trade  
beads and one grain of sand.*

## THE SANDS OF TIME

*by Walter A. Kenyon,  
Associate Curator*

I don't really know, but I like to think that it happened on a sunny afternoon in late spring. The day should have been pleasant, with the black flies and mosquitoes kept under control by a steady and invigorating breeze. Probably the hunter was poling his dugout canoe through the shallows, following the shore of the island on which he lived, when the craft suddenly capsized.

But as I said, I don't really know. For the hunter is long since dead, the water has dried up, and the island is now part of the mainland. All that remains of what was at one time an immense glacial lake is the remnant that we know as Lake of the Woods; for our boating accident happened almost 8,000 years ago, a few miles east of Morson, in Rainy River District, Ontario.

In itself, the accident was probably of no great historical significance. But when the dugout capsized the hunter lost a crudely fashioned stone chopper, and a piece of antler that had







*Largest native monument in Canada—burial mound at Long Sault Rapids, Rainy River. Photo by the author.*

been worked with a beaver-tooth chisel. These were found in 1962 by Mr. Mark Hansen of Morson, and kindly donated to the Museum. A fragment of the antler was dated by the C-14 method, and it was this date ( $5898 \pm 423$  B.C.) which established the antiquity of man in that corner of the province. Other tools of these early residents include long, narrow spear-points and thin blades. All of these specimens were stray finds, picked up by local farmers, and kindly donated to the Museum. Their distribution suggests that they were lost on islands in the long vanished glacial lake.

Through four millennia, changes seem to have occurred in the Rainy River-Kenora area at a very slow pace indeed. The long narrow spear-points gradually disappear, to be replaced by smaller forms with a variety of notches and stems. Then about 2000 B.C., a

major and dramatic change occurred: copper tools and weapons suddenly appear. Unlike the smelted copper that we are all familiar with, these Old Copper specimens were cold-worked from naturally occurring lumps of copper that are found in the Lake Superior area. The distribution of these specimens—in both space and time—suggests that they were not all made by the same people. While “Old Copper” as a distinctive style disappeared in time, the use of native copper persisted throughout the upper Great Lake area and at least as far west as the prairies till historic times.

Most of us think of the introduction of metallurgy as somehow marking the end of the stone age, and the beginnings of something more “civilized.” In Rainy River district, however, this simply didn’t happen. Almost certainly, the natives who first fabricated copper

looked upon it as a kind of stone that had special and peculiar qualities. Whatever they might have thought, life went on very much as it had before. During the long post-glacial period the landscape gradually assumed its present appearance. By some 4000 years ago, water-levels had dropped roughly to their present elevations, and the flora and fauna were sufficiently modern that only a specialist would notice any difference.

Throughout most of his history in the new world, man had been a migratory hunter of large game animals. But with the extinction of so many of these at the close of the ice-age, man had literally to develop a new life style, if I may use the modern idiom. I am not suggesting that the early hunters were purists who would eat nothing but broiled mastodon. They no doubt preferred mastodon, however, even though they might have to make do on occasion with a broiled rabbit or toad. But with the complete disappearance of the mastodon, they were forced to rely entirely on rabbit and toad.

The result of this new economic arrangement

—technically, an ecological adaptation—was that local groups became specialized, each exploiting a regional flora and fauna. In the process of making these adjustments, new tools and techniques were either developed or borrowed from some neighbouring group.

In Rainy River District, this new “life style” becomes manifest in the archaeological record with the appearance of pottery and burial-mounds some 2000 years ago. Specialists have argued for many years (and are still arguing) over the sudden appearance of pottery and burial mounds in the Great Lakes area. To account for its presence there, every possible theory has been advanced at one time or another, with the possible exception of spontaneous combustion. My own opinion is that mound burial was introduced from the south, and will be traced ultimately to Mexico or Central America. As to where the pottery came from, I simply don’t know. I’m not yet prepared to accept spontaneous combustion, but . . . !

There were two different cultures in the Rainy River Area which manufactured pottery

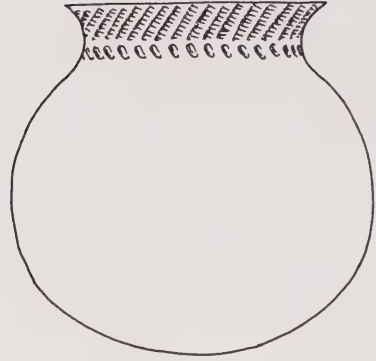
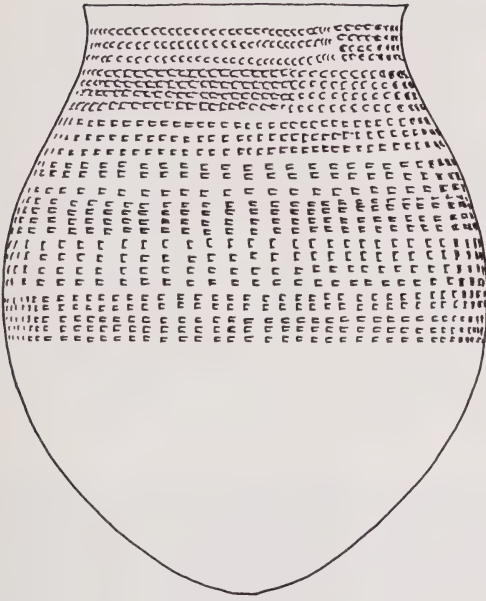
*Old Copper knife, cold-worked from naturally-occurring copper.*





*Carved wooden  
grease ladle, Ojibwa.*





(Left) Laurel vessel; (right) Blackduck vessel.

and buried their dead—at least the important ones—in mounds. These are called the “Laurel” and “Blackduck” cultures, and together make up what we call the “Woodland” period. While these cultures had many things in common, they are still quite distinct, although they are probably related historically, the Laurel being ancestral to the Blackduck which persisted into the early historic period. The most obvious difference between the two cultures is the method used to decorate their pottery vessels. The Laurel people preferred a toothed object like a comb, or an object with a zigzag edge like a scallop-shell; the later Blackduck people preferred to use a cord-wrapped stick or the edge of a cord-wrapped paddle. Actually, the vessel shapes are significantly different also, but this is not too apparent to the average student, as he rarely sees a complete vessel or even a large segment of one.

I must now digress briefly into that somewhat esoteric field of research known as

“ground-hog archaeology.” Most of us are aware of the housing problem in urban communities; few of us realize that this is one of the problems that we share with Rainy River groundhogs. These benign rodents (*Marmota monax*) dwell, alas, in an area that is composed largely of ancient, lake-bottom deposits. And these, of course, are perfectly flat, offering virtually no drainage for the soggy climate that gave the district its name.

When our shrewd and furry little friend wishes to set up housekeeping, therefore, he searches diligently about for some eminence in which to sink his burrow. The result is that every burial-mound that I have seen in Rainy River country has its resident ground-hog.

In the process of burrowing its den, each ground-hog drags to the surface a representative sample of the material that it is burrowing through. An archaeologist working in the area, then, can get a fairly accurate idea of the contents of a mound by simply examining the dirt-pile of the resident rodent. For example, after



practising "ground-hog archaeology" for a few years, I arrived at the following conclusions. Rainy River burial mounds are of two different types and can be distinguished as follows:

- A) Those mounds which are more than three feet in height are composed almost entirely of light, sandy clay subsoil, with a low organic content. Artifacts, in the fill of these mounds, are relatively scarce. All potsherds that the rodent has dragged to the surface are of the Laurel type.
- B) Those which are three feet or less in height are composed largely of dark,

sandy clay with a high organic content. Artifacts in the fill of these mounds are extremely abundant, and both Laurel and Blackduck potsherds are present.

So far, we have excavated only one of the earlier Laurel mounds. This, the Armstrong Mound at the Long Sault Rapids on Rainy River, was about 80 feet in diameter and 8 feet high. At the base of the mound were the remains of 13 individuals lying on the old ground surface. As had been suggested by the activities of the resident ground-hog, only Laurel pottery was found in the fill. A radio-





carbon date suggests that the mound was built about 1000 years ago.

Three of the prehistoric Blackduck mounds have been excavated to date, supplying us with a vast quantity of data which is still being analysed. And again the ground-hogs are batting 1000—their score is perfect. Each of the mounds had a high humic and a high artifact content, and produced both Laurel and Blackduck pottery. The reason for the mixture, of course, is that the Blackduck people, in an area where good campsites are scarce, occupied sites that had formerly been occupied by the Laurel peoples. In gathering up soil to build

their mounds they scraped up not only their own refuse, but that of the earlier occupants as well. Thus the Blackduck mounds contain both types of pottery. Because the Laurel peoples were the ones who introduced pottery to the area, only their own ceramic refuse is present in their mounds.

A much more striking difference between the two cultures, however, is seen in the interior architecture of the Blackduck mounds, and in the quantity and variety of grave-furniture which they contain. Each of the three mounds was built over a deep, sub-mound pit that had been excavated from two to six feet



*Excavation. Burial no. 6,  
Hungry Hall, Mound I.*

*Photo by the author.*



into sub-soil. In the bottom of the pits, on the level or dish-shaped floors, disarticulated skeletons and flexed burials were placed. Clay pots, stone tubes, shell beads and gorgets, bone ornaments, were scattered about to make sure that the souls of the departed were properly launched into the hereafter. And frequently, the entire grave was then sprinkled with red ochre. One of the most spectacular finds of this nature—from a mound at Oak Grove Camp at the very mouth of Rainy River—was a cluster of seven elaborately decorated skulls. The eye sockets and nasal apertures had been filled with clay, shell beads had been pressed into the clay to mark the iris, and the skull then plastered with red ochre. A radio-carbon date tells us that this ceremony took place about 1200 A.D. Last summer at Mound Point, a few miles upstream from Oak Grove Camp, we found, in another sub-mound pit, a skeleton sitting on the floor with his arms sedately crossed, and leaning against the north side of the pit. This must surely be an uncomfortable position in which to spend eternity.

Another mound which we excavated was about 125 miles east of Mound Point, near Kettle Falls at the east end of Rainy Lake. A superficial examination of the mound assured

me that it was a Blackduck mound. The proportions were right, and the activities of the resident ground-hog demonstrated that both types of pottery were present. We began our excavation in the firm conviction that we knew exactly what we were doing. I even pointed out to the crew the exact spot where we would find the sub-mound pit. As we worked our way through the mound, we encountered a series of burials each of which was seriously disturbed, and accompanied by grave-furniture of both native and European origin. But we did not find a pit! Reluctantly, I was forced to the conclusion that I had now dug my way, however superficially, through almost 7000 years of pre-history and was now in the historic period.

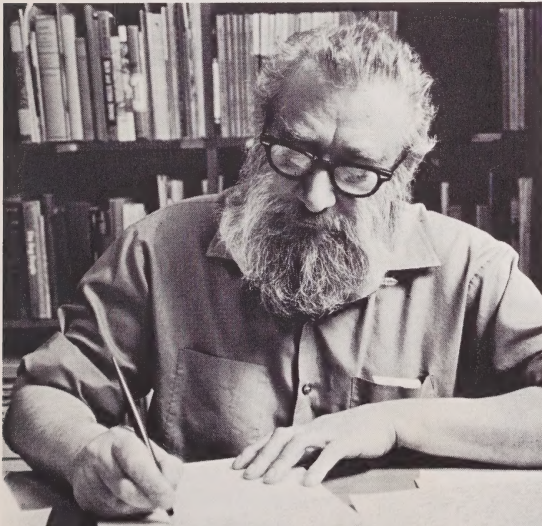
My main interest, at that point, was in sorting out and describing the pre-historic sequence of peoples and cultures in Rainy River District. As I left Kettle Falls, however, I could not but be pleased with the assortment of brass kettles, beads, thimbles, axes, mirrors, and carved wooden spoons that had been collected. Still, it was with a vague sense of satisfaction that I noticed the rising waters, and the look of consternation on the face of the Kettle Falls ground-hog.

*Confrontation.  
Decorated skull emerging.  
Photo by the author.*





*The official resident ground-hog. Courtesy Ontario Department of Lands and Forests.*



Walter Kenyon first put his trowel in Rainy River ground in 1957. Since then, he has been back for two to six weeks every year for the past 14 seasons. He was there again in June, watching ground-hogs, as usual. In addition to excavations at Rainy River, Dr. Kenyon has been extensively involved in underwater archaeology along the Fur Trade Route, and has directed expeditions at Fort Albany on James Bay. He will begin preparing the report on Fort Albany in the fall, when he returns from this season's dig.



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